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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,529	03/30/2004	Tadahiko Kubota	09792909-5847	6143

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EXAMINER	
ECHELMEYER, ALIX ELIZABETH	
ART UNIT	PAPER NUMBER
1729	

MAIL DATE	DELIVERY MODE
12/06/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/813,529	KUBOTA ET AL.	
	Examiner	Art Unit	
	Alix Elizabeth Echelmeyer	1729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,6 and 8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,6 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 29, 2010 has been entered.

2. Claim 1 is amended. Claims 1, 3, 6, and 8 are pending and are rejected for the reasons given below.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. (US 2002/0028389) in view of Oyama et al. (WO 02/33765) and Okamoto et al. (US 2003/0027050).

Sonoda et al. teach a non-aqueous electrolyte for use in an electrochemical device such as a lithium battery (abstract, [0001]). As for claim 1, it is well known to

those having ordinary skill in the art that a lithium battery contains a cathode, an anode and an electrolyte.

Sonoda et al. teach a silicon material for the anode active material layer ([0044]).

The electrolyte of Sonoda et al. contains a solute represented by formula (1): $MBR^1R^2R^3R^4$ (abstract, [0010]). R^1, R^2, R^3 and R^4 may be represented by C_nF_{2n+1} or $C_mF_{2m+1}SO_2$ ([0011]). Additionally, since formula (1) is in solution in the electrolyte, it can be considered as its cation and anion: M^+ $(BR^1R^2R^3R^4)^-$ ([0019]).

A specific example of the material represented by formula (1) includes $LiB(CF_3)_4$ ([0012]), which is identical to the material disclosed in the instant specification (see paragraph 5, above).

As for the limitation concerning the cathode active material, Sonoda et al. disclose that the positive active material is a transition metal complex oxide ([0051]).

As for claim 3, examples of the negative material include carbon materials, TiS_2, and alkali metals such as silicon ([0044]).

With further regard to claim 1, Sonoda et al. fail to teach that the moisture content in the electrolyte is 100 ppm or less at a mass ratio in relation to the electrolyte.

Sonoda et al. teach that too much moisture in the electrolyte causes it to decompose ([0004]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to find the lowest tolerable amount of moisture in the electrolyte to

prevent decomposition, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. MPEP 2144.05 (II B).

Regarding claims 1, 6, and 8, the electrolyte of Sonoda et al. may also include additional anions such as one or a mixture of PF_6^-, BF_4^-, ClO_4^-, AsF_6^- or $N(CF_3SO_2)_2^-$ ([0068]).

Sonoda et al. fail to teach that the electrolyte also contains an anion having Chemical formula 4.

Oyama et al. teach a gel-type polymer electrolyte preferably includes the salts discussed above as well as $C(CF_3SO_2)_3^-$ (page 18 lines 21-26).

It is well known in the art to substitute various Li salts, or anion, in the gel polymer electrolyte of batteries, as evidenced by the teachings of both Sonoda et al. and Oyama et al. of various different anions for use in electrolytes,

One of ordinary skill in the art could have substituted or added the $C(CF_3SO_2)_3^-$ anion disclosed by Oyama et al. in the electrolyte of Sonoda et al. and the results would have been predictable. MPEP 2141 III.

With further regard to claim 1, Sonoda et al. teach silicon as the anode active material ([0044]) but fail to teach that the anode active material is a silicon thin film.

Okamoto et al. teach the use of a silicon thin film as the anode active material in a rechargeable lithium battery ([0037]-[0038]). Okamoto et al. teach that silicon is preferable to other materials, and that it is capable of storing lithium via alloying.

Okamoto et al. teach that the thin film may be made by CVD or sputtering ([0039]).

According to Applicant's arguments, filed February 12, 2009, the gas phase deposition method inherently inhibits destruction by expansion or shrinkage of the anode material and forms an alloy between at least part of the interface between the active material layer and the anode current collector (see page 6, first full paragraph).

It would be desirable to make a silicon thin film anode active material layer in the battery of Sonoda et al. such as taught by Okamoto et al. since the skilled artisan would recognize that the anode active material could be made with a thin film, reducing the weight, size, and energy density of the battery.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make a silicon thin film anode active material layer in the battery of Sonoda et al. such as taught by Okamoto et al. since the skilled artisan would recognize that the anode active material could be made with a thin film, reducing the weight, size, and energy density of the battery.

Response to Arguments

5. Applicant's arguments filed October 5, 2010 have been fully considered but they are not persuasive.

As is discussed above and in the Advisory Action dated October 15, 2010, Sonoda et al. teach a silicon material for the negative active material [0044]. Applicant's

argument that Sonoda et al. do not teach the newly added limitation of claim 1 are not convincing for this reason.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ula Ruddock can be reached on 571-272-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ula C Ruddock/
Supervisory Patent Examiner
Art Unit 1795

Alix Elizabeth Echelmeyer
Examiner
Art Unit 1729

aee